

LAKE RENOVATION

Fish Creek Dam in Morton County is one of North Dakota's more picturesque fishing waters. Created by a small earthen dam that caps a tributary to the Heart River, Fish Creek is surrounded by contrasting hillsides – some with stands of buffaloberry and hawthorne, others laden with wildflowers that stand out in summer's green prairie grasses.

Despite its aesthetic setting and proximity to Bismarck-Mandan, North Dakota's second largest metropolitan area, hardly anyone fished at Fish Creek during the late 1980s and early 1990s. This lack of activity was not for lack of fish.

Just the opposite, actually. Fish Creek had too many fish – small yellow perch, mostly, but also white sucker and bullhead – that negated North Dakota Game and Fish Department efforts to develop a fishery that attract interest.

In the right situation, where they have enough space and food, yellow perch grow large and can pull in anglers from hundreds of miles away. In the wrong situation, like at Fish Creek, they can overpopulate a lake. With intense competition for limited food, they don't grow much. Three-year-old fish are about the same size as 6-year-old fish, and few of them grow big enough to put up a good fight or produce a worthwhile fillet.

When this happens, when one or more unpopular or undesirable fish species come to dominate a lake's fishery and reduce its value to anglers, it creates a dilemma for Game and Fish Department managers. On some occasions, introduction of a predator fish such as northern pike or largemouth bass can cull the overpopulated species back into balance. Sometimes, a concentrated netting effort by Department biologists or local wildlife club members can remove enough unwanted fish to create adequate space for desirable species.

Generally, however, the best way for Game and Fish biologists to restore order to a wayward fishing lake is to kill all of its fish and start over. Once a lake is clean, newly stocked fish have no competition or predators and they grow fast. Depending on the species mix, within a couple of years anglers are back in force with renewed excitement.

Fisheries workers have been doing this in special situations since the 1950s. Called chemical renovation or lake eradication, it involves dispersing special chemicals in the lake and its watershed to eliminate all fish.

The substance Game and Fish has used in the past 15 years is called rotenone, a natural chemical derived from the root of a tropical plant. When mixed into water, it kills fish by disrupting the process that allows fish to use oxygen absorbed into the blood. Amphibians are not typically harmed, though aquatic insects and zooplankton are affected, but return rapidly. In only a few weeks, the rotenone breaks down and a lake is ready for restocking.

Water treated with rotenone is not harmful to animals or humans, nor are fish killed by rotenone a risk to birds or mammals that might eat them.

Chemical renovation is usually a last-resort option pursued after other attempts to revitalize a fishery have not worked. It is expensive. In addition to undesirable fish, it kills whatever good fish are left in a lake. It almost guarantees that a lake with little previous use will have no use for at least a year.

But chemical renovation does work. At Fish Creek, a complete fish kill in fall 1991 set the stage for a shoreline lined with anglers by 1994. On one spring weekend day that year, a district game warden noted more people fishing than he had seen total at Fish Creek the 5 years prior to renovation in 1991.

During a two-year period starting in fall 1991, Game and Fish biologists renovated 14 major lakes. In the 15 years prior to that, the process was only used occasionally.

Renovation became a more viable practice for a couple of reasons. First, fisheries technicians in Utah developed a way to mix powdered rotenone with water to create a slurry for consistent application and coverage. Game and Fish biologists adapted this method to work in North Dakota. Since powdered rotenone is cheaper than its liquid version, the cost for treating a lake went down. In addition, lingering drought in North Dakota had also lowered water levels on many lakes, further reducing cost for treatment.

Second, expansion at Garrison Dam National Fish Hatchery allowed more room for growing larger trout, meaning trout could be stocked at a catchable size of 8-10 inches long. Within a year, these fish could grow to 12-14 inches.

With bass, bluegill, walleye, pike or other game fish, a lake might have to remain closed for up to 3 years before these fish reached catchable size. While many renovated lakes were not planned as long-term trout waters, trout are ideal for creating a renewed fishery until other stocked fish have time to grow.

Renovated lakes often develop into outstanding fisheries for a few years. How long that productivity lasts depends on a variety of factors. The greatest concern is whether the fish species that caused problems in the first place, or another species that could cause problems, somehow get back in the lake.

Unwanted fish species are a major problem for North Dakota fisheries managers. Many lakes that were treated in the last 40 years have had unwanted species reintroduced. Over that time, illegal species introductions have cost North Dakota anglers millions of dollars in management actions and lost recreation opportunity.

Of 14 major lakes renovated in 1991-93, 11 have had undesirable species reintroduced. Of 13 lakes Game and Fish biologists have renovated since 1993, another 11 have had undesirable species reintroduced. That's 22

lakes on the road to having the same problem as before.

These undesirable introductions typically occur in two ways. One is via bait. Anglers may innocently dump leftover baitfish in the water, and the bait bucket contains a hidden undesirable fish such as a white sucker, bullhead or carp, especially from those anglers who trap their own bait. Or, anglers use live baitfish in lakes where this is not allowed, and unwanted fish end up in the water.

Two, anglers who don't like the mix of fish in a lake illegally dump in the species they want. That's likely how perch got back in Fish Creek and several other renovated lakes.

At a typical cost of \$6,000 to \$10,000 to renovate a lake, which doesn't include the cost of lost recreational hours while the lake recovers, the likelihood of anglers reintroducing problem species weighs heavily on fisheries management decisions. That's part of the reason renovations were scaled back after the early 1990s. The other reason is that the wet cycle that started in 1993 created a whole bunch of new fishing lakes. The number of manageable lakes in the state more than doubled, reducing time available to pursue renovations, and also reducing the urgent need to create better fishing opportunities. Mother Nature, in the short term, accomplished that.

But in the long term, lakes with undesirable species didn't magically solve their own problems. Now, fisheries managers are more intently evaluating potential renovation projects. North Dakota has more than 20 lakes in which a serious undesirable fish problem has developed since 1990. That's in addition to dozens of other lakes that have long-term unwanted fish populations.

One of those lakes, Camel Hump Dam in Golden Valley County, is scheduled for rotenone application this summer. It's the second time Department fisheries managers will have treated the lake.

Following are some factors fisheries managers must weigh when deciding whether renovation is the way to go, From Both Sides.

One Side

- Chemical renovation is not selective of one species over another. Game and Fish is charged with managing all fish species, not just those that some anglers prefer. Fish that are in a lake should not be killed to make way for others that don't exist in a lake.
- Chemical renovation is not always 100 percent effective. If a few unwanted fish still remain in the lake, it doesn't take long for the problem to redevelop and the money invested in the renovation is mostly wasted.
- History has proven that unwanted species are often purposely or unintentionally reintroduced into clean lakes by citizens. It is expensive and time-consuming to renovate a lake, knowing that the same process may have to be repeated years down the road.



Craig Bihre

Fish Creek Dam was treated with rotenone nearly 13 years ago. It thrived as a fishery for many years following. In recent years, unwanted species were illegally introduced back in to the lake.

- Other animals such as fish-eating birds may lose a food source for a period of time.
- The chemicals can be hazardous to handle.

The Other Side

- Renovation is often the best way to rebuild a fishery for the long-term. Netting undesirable fish, or introducing other species do not eliminate problem fish from the lake.
- Renovation creates a productive lake environment conducive to rapid fish growth. It eliminates fish that were not part of the lake in the first place.
- Sacrificing a fair to poor fishing lake for a year or more is in most cases a favorable trade for several years of good fishing in the future.
- Depending on the target species, eliminating a problem fish can result in water quality improvement, and subsequent return of beneficial aquatic organisms.
- Use of rotenone is the only way to eliminate problem fish populations short of completely draining a lake.

What do you think? To pass along your comments, send us an email at ndgf@state.nd.us; call us at 701-328-6300; or write North Dakota Game and Fish Department, 100 N. Bismarck Expressway, Bismarck, ND 58501.

FROM BOTH SIDES